TO: RANDY

Air Resources Board

John D. Dunlap, III, Chairman
P.O. Box 2815 · 2020 L Street · Sacramento, California 95812 · www.arb.ca.gov

Peter M. Rooney
Secretary for Environmental Protection

Pete Wilson
Governor

MEMORANDUM

TO: Doug Okumura, Chief
Environmental Monitoring and Pest
Management Branch
Department of Pesticide Regulation

FROM: George Lew, Chief
Engineering and Laboratory Branch
Monitoring and Laboratory Division

DATE: June 15, 1998

SUBJECT: FINAL REPORT FOR THE EPTC MONITORING IN MERCED AND IMPERIAL COUNTIES

Attached is the final report, "Report for the Air Monitoring of EPTC in Merced County (Application) and Imperial County (Ambient)".

These results are intended for identifying the presence of EPTC in ambient air. Additional air monitoring near the use of EPTC may be necessary to determine if there is a need for mitigation.

If you or your staff have questions or need further information, please contact me at (916) 263-1630 or Mr. Kevin Mongar at (916) 263-2063.

Attachment

cc: Ray Menebroker, SSD w/Attachment and Appendices
Stephen L. Birdsall, Imperial County Agricultural Commissioner w/Attachment
Michael J. Tanner, Merced County Agricultural Commissioner w/Attachment
David L. Crow, SJVUAPCD w/Attachment
Sharon Seidel, OEHHA w/Attachment
Jim Baballe, AMB Enterprises w/Attachment
Pam Wales, DPR w/Attachment and Appendices

State of California
California Environmental Protection Agency
AIR RESOURCES BOARD

Report for the Air Monitoring of EPTC In Merced County (Application) and in Imperial County (Ambient)

Engineering and Laboratory Branch

Monitoring and Laboratory Division

Project No.
C97-021 (application)
C96-035 (ambient)

Date: June 10, 1998

APPROVED:

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Engineering and Laboratory Branch

This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

Summary

**Report for the Air Monitoring
of EPTC
In Merced County (Application) and in
Imperial County (Ambient)**

This report presents the results of application (Merced County) and ambient (Imperial County) air monitoring for EPTC. Application monitoring was conducted from May 26 to 30, 1997 and ambient monitoring from October 9, 1996 through November 24, 1996. Application monitoring was associated with the use of EPTC as a pre-plant/pre-emergent herbicide on a corn field. Ambient monitoring was conducted to coincide with the use of EPTC on alfalfa. Application and ambient sample results are reported in Tables 4 and 7 respectively. Summaries of application and ambient sample results for EPTC are reported in Tables 5 and 8 respectively. Laboratory results (in units of ug/sample) equal to or above the limit of quantitation (LOQ) are reported to 3 significant figures. Air concentration results (in units of ug/m^3 or pptv) are reported to 2 significant figures. For the ambient study only, results below the LOQ but equal to or above the limit of detection (LOD) are reported as "detected".

Analyses for the application samples were performed by the California Department of Food and Agriculture's (CDFA) Worker Health and Safety Laboratory. The analytical LOQ for EPTC was 0.090 ug/sample. The method LOQ, expressed in units of ug/m^3 (or pptv), is dependent on the volume of air sampled which varies from sample to sample. The method LOQ for a 12-hour sampling period at 1.9 Lpm would be 0.066 ug/m^3 (8.5 pptv). Results of the four application background samples were found to be below the LOQ. Results for seventeen of the twenty-four application samples (spikes, blanks, colocated and background samples excluded) were above the LOQ for EPTC and the remaining seven sample results were less than the LOQ. The highest EPTC concentration, 12 ug/m^3 (1500 pptv) was observed at the south sampling site during the fourth sampling period (9 hour sample).

Analyses for the ambient samples were performed by the ARB Testing Section laboratory. The analytical LOD and LOQ were 0.0597 ug/sample and 0.197 ug/sample respectively. The method LOD and LOQ, expressed in units of ug/m^3 (or pptv), are dependent on the volume of air sampled, which varies from sample to sample. The method LOD and LOQ for a 24-hour sampling period at 1.9 Lpm would be 0.022 ug/m^3 (2.8 pptv) and 0.072 ug/m^3 (9.3 pptv) respectively. None of the twenty-four samples collected at the urban background (ARB) site had EPTC results above the LOQ. Eight of the background site samples had "detected" results for EPTC. Of the ninety-six ambient samples taken (spikes, blanks, colocated, and background site samples excluded), twenty-two (23%) were found to be above the LOQ, twenty-one (22%) were found to be "detected" and fifty-three (55%) were found to be below the LOD. The highest ambient EPTC concentration observed was 0.24 ug/m^3 (31 pptv) at the Meadows Union School monitoring site on October 16, 1996.

Acknowledgments

Eric Lapurga, Ken Lewis and Neil Adler were Instrument Technicians who collected ambient and application samples. Assistance was provided by the Quality Management and Operations Support Branch (QMOSB) of the ARB. Assistance was provided by the Imperial County Agricultural Commissioner's Office and the Merced County Agricultural Commissioner's Office. Chemical analyses were performed by the Testing Section Laboratory (ambient samples) and by the California Department of Food and Agriculture's Worker Health and Safety Laboratory (application samples).

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Report for the Air Monitoring
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I. Introduction

At the request of the California Department of Pesticide Regulation (DPR), (October 31, 1995 Memorandum, Sanders to Lew) the Air Resources Board (ARB) staff determined airborne concentrations of the pesticide EPTC over a six week ambient monitoring program in populated areas of Imperial County and over a 72 hour application monitoring program in Merced County. This monitoring was done to fulfill the requirements of AB 1807/3219 (Food and Agricultural Code, Division 7, Chapter 3, Article 1.5) which requires the ARB "to document the level of airborne emissions .... of pesticides which may be determined to pose a present or potential hazard..." when requested by the DPR.

The sampling protocol, "Protocol for the Ambient Air Monitoring of EPTC in Imperial County During Fall, 1996", is enclosed separately as Appendix I (page 1 of a separate volume of appendices to this report).

The California Department of Food and Agriculture, Worker Health and Safety Laboratory (CDFA) report, "Air Sample Analysis Report for EPTC Application", is enclosed separately as Appendix II (page 25 of the separate volume of appendices to this report).

The Quality Management and Operations Support Branch (QMOSB) report, "System Audit Report Ambient Monitoring of EPTC in Imperial County", is enclosed separately as Appendix III (page 62 of the separate volume of appendices to this report).

The pesticide use recommendation and pesticide use report for the application study are enclosed separately as Appendix IV (page 80 of the separate volume of appendices to this report).

The DPR's October 31, 1995 memorandum, "Monitoring Recommendations for EPTC", is enclosed separately as Appendix V (page 82 of the separate volume of appendices to this report).

The application and ambient field log sheets are enclosed separately as Appendix VI (page 82 of the separate volume of appendices to this report).

The application meteorological monitoring results are enclosed separately as Appendix VII (page 99 of the separate volume of appendices to this report).

The method development results and "Standard Operating Procedures for the Sampling and Analysis of EPTC in Ambient Air" are enclosed separately as Appendix VIII (page 107 of the separate volume of appendices to this report).

II. Chemical Properties of EPTC

The following information regarding the chemical properties of EPTC was obtained from the DPR's October 31, 1995 "Monitoring Recommendation for EPTC".

EPTC (CAS: 759-94-4) is a colorless to light yellow liquid with an amine-like odor. Technical grades are yellow. EPTC has a molecular formula of $C_9H_{19}NOS$, a formula weight of 189.32 g/mole, and density of 0.960 g/ml at 25 °C. It has a water solubility of 375 mg/L at 25 °C, a Henry's Constant of 1.0×10^{-5} atm • m^3 /mol at 20 - 25 °C, and a vapor pressure of 3.4×10^{-2} mmHg at 20 °C. EPTC is miscible with most organic solvents.

EPTC is rapidly metabolized by soil micro-organisms to carbon dioxide, mercaptan, and amino residues. Mineralization has not been reported in sterile soils due to the lack of production of carbon dioxide. Soil half-life ($t_{1/2}$) ranges from 4-6 weeks when applied at recommended rates. In plants, EPTC is rapidly metabolized to carbon dioxide and other naturally occurring plant constituents. EPTC sulfoxide has been reported in some soils and in corn plants.

The acute oral LD_{50} of EPTC for male rats and mice is 1,700 and 3,200 mg/kg. The LC_{50} (48 hour) for rainbow trout is 19 mg/L, and 27 mg/L for bluegill sunfish. EPTC has entered the risk assessment process at DPR under the SB 950 (Birth Defect Prevention Act of 1984) based on its potential neurotoxicity, mutagenicity, and teratologic and chronic toxicity adverse health effects.

III. Sampling

Samples were collected by passing a measured volume of ambient air through XAD-2 resin (SKC #226-30-06). The flow rate (1.9 L/minute) was accurately measured and the sampling system operated continuously with the exact operating interval noted. The resin tubes were protected from direct sunlight and supported about 1.5 meters above the ground during the application sampling and about 1.5 meters above roof tops at the ambient sites. At the end of each sampling period, the tubes were capped and placed in culture tubes with an identification label affixed. Subsequent to sampling, the sample tubes were stored and transported in an ice chest on dry ice, as soon as reasonably possible, to the ARB Monitoring and Laboratory Division, Testing Section laboratory for the ambient sample analyses and to the CDFA for application sample analyses. The samples were then stored in a freezer or analyzed immediately.

A sketch of the sampling apparatus is shown in Figure 1 of Appendix I (page 8 of appendices). Calibrated rotameters were used to set and measure sample flow rates. Samplers were leak checked prior to and after each sampling period with the sampling cartridges installed. Any change in the flow rates was recorded in the field log book. The field log book was also used to record start and stop times, sample identifications and any other significant comments.

A. Application Monitoring

The use patterns for EPTC suggested that application-site monitoring should be performed during the months of April, May or June and that the monitoring should be associated with applications to corn. Application rates to corn generally range from 4.5 to 6 lbs. AI/acre in San Joaquin and Merced Counties. A three day monitoring period was to be established with intended sampling times as follows: (where the first sample is started at the start of application) application + 1 hour, followed by one 2-hour sample, one 4-hour sample, two 8-hour samples and two 24-hour samples. Information collected included: 1) the elevation of each sampling station with respect to the field, 2) the orientation of the field with respect to North (identified as either true or magnetic), 3) an accurate record of the positions of the monitoring equipment with respect to the field, including the distance each monitor is positioned away from the edge of the field and an accurate drawing of the monitoring site showing the precise location of the monitoring equipment and any wind obstacles with respect to the field, 4) the field size, 5) the application rate, 6) formulation and 7) method and length of application.

An approximately 39 acre corn field was chosen for the application monitoring site. Refer to Figure 2 for a diagram of the application site. Refer to Appendix IV (page 80 of the appendices) for a copy of the pesticide control advisor's "Pesticide Use Recommendation" and "Pesticide Use Report". The pesticide use report shows that only 35 acres of the 39 acre field received the pesticide application. The reason for the discrepancy is not clear, however, the edges of the field and the dirt roads surounding the field may make up part of the remaining 4 acres. Details regarding the site and application are summarized in Table 1.

Table 1. Application Information

County/Section/Township/Range:	CA24/23/6S/10E
Product Applied:	Eradicane 6.7E
Type of Application:	Ground spray followed immediately by discing into the soil
Application Rate:	30 gallons of Eradicane 6.7E in 875 gallons of water on 35 acres (5.74 lbs. A.I./acre/35 acres)
Grower:	Ahlem Farms, 9072 Columbus, Hilmar, CA 95324
Applicator:	Jim Baballe, A&B Enterprises, 9374 Columbus, Hilmar, CA. 95324

Background samples were collected from 1245 May 26 to 0700 May 27, 1997 at the site of the application test (one sample at each of the four sampling sites). The application started at 1100 (was scheduled to start at 0800) on May 27, 1997 and finished at 1500 the same day. Referring to Figure 2, the application started at the north-west corner of the plot with the rows oriented east/west. Table 2 lists the actual sampling intervals (individual sample times will vary slightly).

TABLE 2. Application Sampling Periods

Sampling Period			
1	application plus 1 hour	5/27/97	0700 to 1600
2	2.0 hour	5/27/97	1600 to 1800
3	4.0 hour	5/27/97	1800 to 2200
4	9.0 hour	5/27-28/97	2200 to 0700
5	24 hour	5/28-29/96	0700 to 0700
6	25 hour	5/29-30/96	0700 to 0800

Four samplers were positioned, one on each side of the field. A fifth sampler was colocated at the south position. The north (N), west (W), east (E) and south (S) samplers were positioned 15 yards, 10 yards, 19 yards and 12 yards from the field respectively. The west, north and east samplers were at the same elevation as the field while the south sampler was positioned on a small levee approximately 2.5 feet above the field. The meteorological station was positioned 40 yards east of the south sampling station.

The meteorological station was set up to determine wind speed and direction, relative humidity, barometric pressure and air temperature. The station measurement height was approximately 10 to 12 feet. This station continued to operate continuously throughout the sampling period collecting data at 1 minute intervals using a data logger. Appendix VII (page 99 of the appendices) lists the meteorological station data in 15 minute averages. The meteorological station data will also be forwarded along with this report on a 1.44 MB diskette (comma delimitted format). ARB staff noted the degree of cloud cover at the start of application and whenever sample cartridges were changed. The skies were clear during the entire monitoring period.

B. Ambient Monitoring

The use patterns for EPTC suggested that ambient monitoring should take place in Imperial County during a 30- to 45-day sampling period in the months of October and November. Sampling sites were selected based on their proximity to alfalfa growing areas. Four sampling sites were selected in relatively high-population areas or in areas frequented by people. Background samples were collected in an area distant to EPTC applications. Replicate (colocated) samples were collected for seven dates at each sampling location. The five sites were at the locations listed in Table 3 and are mapped in Figure 1.

	TABLE 3. Ambient Sampling Sites	
MU	Meadows Union School S-80 at Bowker Road Holtville, CA 92250 Range/Township/Section: R14E/T15S/S36-S1/2	(760) 352-7512 Larry Kelly
EL	Agricultural Commissioner's Office 150 S. 9th St. El Centro, CA 92243 Range/Township/Section: R13E/T15S/S6-NW1/4	(760) 339-4314 Linda Evans
IH	Imperial High School 517 W. Barioni Blvd. Imperial, CA Range/Township/Section: R13E/T15S/S13-NE1/4	(760) 355-3220 Joe Maruca
AR	ARB Ambient Monitoring Station 1029 Ethel Calexico, CA 92231 Range/Township/Section: R14E/T16 1/2S/S14-NE1/4	(818) 575-6856 Curt Schreiber (Background site)
HF	Imperial County Fire Department 1085 Ingram Heber, CA 92249 (760) 352-6104 Range/Township/Section: R13E/T16S/S27-SW1/4	(760) 353-0323 Ricardo Valenzuela

The Meadows Union School is is located on the east side of Bowker Road just south of highway 80. There is agriculture within approximately 200 yards of the school on the east, south and west sides with a residential area just to the north. The sampling unit was placed on the roof of a utility building at a height of approximately 10 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 14 feet above the ground.

The Imperial County Agricultural Commissioner's Office is located in the business/residential area of El Centro. There is no agriculture in the immediate area around the site. The sampling unit was placed on the roof of the three story building at a height of approximately 30 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 34 feet above the ground.

The Imperial High School is located in a residential area of Imperial. The nearest agriculture is approximately 1 mile away to the north and west of the school. The sampling unit was placed on the roof of a one story building at a height of approximately 12 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 16 feet above the ground.

The ARB Ambient Monitoring Station is located on the east side of Calexico. The nearest agriculture is appproximately 2 miles to the north or east. The sampling unit was placed on the roof of the one story trailer at a height of approximately 12 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 16 feet above the ground.

The Imperial County Fire Department is located in the small town of Heber. There are agricultural fields approximately 200 yards to the south, 300 yards to the west and 1 mile to the north and east. The sampling unit was placed on the roof of the one story building at a height of approximately 13 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 17 feet above the ground.

The samples were collected by ARB personnel over a six week period from October 9 - November 21, 1996. Twenty-four hour (approximately) samples were taken Monday through Friday (4 samples/week) at a flow rate of 1.9 liters per minute. Twenty-four discreet sampling-days were monitored at each site over the 43 day period for a total of 121 samples (plus 30 colocated samples, 7 trip blanks and 20 quality assurance spikes).

IV. Analytical Methodology Summary

The exposed XAD-2 resin tubes (SKC #226-30-06) are stored in an ice chest on dry ice or refrigerator until desorbed with 3 mL of ethyl acetate. A gas chromatograph with a DB-35 capillary column and a mass selective detector (SIM mode) is used for the analyses. Refer to the analytical SOP attached in Appendix VIII (page 107 of the appendices) for specific details.

V. Application and Ambient Results

Quality assurance results are discussed below in Section VII.

Tables 4 and 7 present the results of application (Merced County) and ambient (Imperial County) air monitoring for EPTC. Summaries of sample results are reported in Tables 5 (application) and 8 (ambient). Sample results equal to or greater than the limit of quantitation (LOQ) are reported, in units of ug/m^3 and pptv, to 2 significant figures. For the ambient data only, results below the LOQ but equal to or above the limit of detection (LOD) are reported as "detected". The equation used to convert EPTC air concentration from units of ug/m^3 to volume/volume units at 1 atmosphere and 25 °C is:

$$pptv = (ug/m^3) \times (1000) \times \frac{(0.0820575 \text{ liter-atm/mole-°K})(298 °K)}{(1 \text{ atm})(189.32 \text{ gram/mole})} = (129) \times (ug/m^3)$$

A. Application Monitoring Results

Application sample results are also summarized as associated with each sampling period "wind rose" in Figure 3. The "spokes" of the wind rose correspond to the compass direction of origin of the wind. For example, the wind was predominantly from the northwest during the background sampling period. The segments of each spoke correspond to incremental

increases in wind speed of 2 mph each. The length of the spoke (and each segment) corresponds to the portion of the sampling time that the wind was from that direction (at that velocity).

Analyses for the application samples were performed by the California Department of Food and Agriculture's (CDFA) Worker Health and Safety Laboratory. For the application data, the CDFA calculated the LOQ by: LOQ = 10 x Noise. The analytical LOQ for EPTC was 0.090 ug/sample. The CDFA did not report a specific LOD or any results below their estimated LOQ. The method LOQ, expressed in units of ug/m^3 (or pptv), is dependent on the volume of air sampled, which varies from sample to sample. The method LOQ for a 12-hour sampling period at 1.9 Lpm would be 0.066 ug/m^3 (8.5 pptv). Sample results equal to or greater than the LOQ are reported, in units of ug/m^3 and pptv, to 2 significant figures. Results of the four application background samples were found to be below the LOQ. Results for seventeen of the twenty-four application samples (spikes, blanks, colocated and background samples excluded) were above the LOQ for EPTC and the remaining seven sample results were less than the LOQ. The highest EPTC concentration, 12 ug/m^3 (1500 pptv; average of the two colocated samples), was observed at the south sampling site during the fourth (9 hour) sampling period.

Application samples were held in the freezer at the CDFA for several months prior to extraction and analysis. The maximum period of time between sampling and extraction/analysis was 105 days. A freezer stability study conducted during this time showed that EPTC recovery was 96% after 102 days (refer to Section VII below). Also, the field spikes were not analyzed until 102 days after preparation. The average recovery of the field spike samples was 88%. Thus, the freezer storage time of several months had little or no effect on the samples.

B. Ambient Monitoring Results

Analyses for the ambient samples were performed by the ARB Testing Section laboratory. The results of the ambient monitoring is provided in Table 7 and a summation of the results is provided in Table 8. The LOD calculation used by the Testing Section Laboratory for the ambient data was: LOD = $X_{intercept}$ + 3(SD). The LOQ is defined as 3.3 times the LOD. Refer to the analytical SOP attached in Appendix VI (page 107 of the appendices) for specific LOD calculation details. The analytical LOD and LOQ were 0.0597 ug/sample and 0.197 ug/sample respectively. The method LOD and LOQ, expressed in units of ug/m^3 (or pptv), are dependent on the volume of air sampled, which varies from sample to sample. The method LOD and LOQ for a 24-hour sampling period at 1.9 Lpm would be 0.022 ug/m^3 (2.8 pptv) and 0.072 ug/m^3 (9.3 pptv) respectively. None of the twenty-four samples collected at the urban background (ARB) site had EPTC results above the LOQ. Eight of the background site samples had "detected" results for EPTC. Of the ninety-six ambient samples taken (spikes, blanks, colocated, and background site samples excluded), twenty-two (23%) were found to be above the LOQ, twenty-one (22%) were found to be "detected" and fifty-three (55%) were found to be below the LOQ. The highest ambient EPTC concentration was 0.24 ug/m^3 (31 pptv) at the Meadows Union School monitoring site on October 16, 1996.

VI. Quality Assurance

Field quality control (QC) for the application monitoring included: 1) four field spikes (same environmental and experimental conditions as those occurring at the time of ambient sampling) prepared by the CDFA staff (the field spikes were colocated with the background samples), 2) four trip spikes prepared by the CDFA staff, 3) four lab spikes prepared by the CDFA staff, 4) replicate samples (colocated) collected at one of the four sampling sites, and 5) background samples. The DPR's October 31, 1995 memo, "Monitoring Recommendation for EPTC", stated that "Field blank and field spike samples should be collected at the same environmental (temperature, humidity, exposure to sunlight) and experimental (similar air flow rates) conditions as those occurring at the time of sampling." Actual field spike samples were collected at the same environmental and experimental conditions (colocated) as those occurring at the time of background sampling. However, no "field blanks" were collected. Collection of true field blanks would involve rather complicated procedures and is not practical under field conditions. The trip blank was collected at the time of the sampling but did not experience the same environmental and experimental conditions except for transport and storage.

Field QC for the ambient monitoring included: 1) four field spikes (same environmental and experimental conditions as those occurring at the time of ambient sampling) prepared by the QMOSB and spiked at two different levels; the field spikes were obtained by sampling ambient air at the background monitoring site for 24 hour periods at 1.9 L/minute (colocated with an ambient sample); 2) four trip spikes prepared by the QMOSB and spiked at two different levels; 3) eight lab spikes prepared by the QMOSB and spiked at four different levels; 4) a QMOSB colocated "blank" (a nonspiked tube colocated with the ambient background), trip blank and lab blank, 5) replicate (colocated) samples taken for seven dates at each sampling location; and 6) trip blanks collected once per week (see comment above regarding field blanks).

The instrument dependent parameters (reproducibility, linearity and LOD) are discussed in the SOP (page 107 of the appendices) and in the CDFA analytical report (page 25 of the appendices). A chain of custody sheet accompanied all samples. Rotameters were calibrated as outlined in the "Quality Assurance Plan for Pesticide Monitoring". Refer to Appendix III (page 71 of the appendices), "Final EPTC 1996 QA Audit Report", for rotameter flow audit results.

VII. Quality Assurance Results

A. Method Development

Refer to Appendix VIII (page 107 of the appendices), "Standard Operating Procedure for the Analysis of EPTC in Ambient Air", for discussion and results of method development studies (LOD, LOQ, method reproducibility, recovery and sample stability). For the stability study, the primary sections of eight sampling cartridges were spiked with 2.67 ug of EPTC. The spiked tubes were stored in the freezer at -20 C and extracted/analyzed on storage days 0, 2, 6 and 29. Two tubes each were analyzed on each day. The storage recoveries (average results) were 101%, 110% and 109% for days 0, 2, 6 and 29 respectively. A

freezer stability study was also performed during the application study. Four cartridges were spiked with 1.78 ug of EPTC and extracted/analyzed on storage day 102. The storage recoveries were 94%, 96%, 99% and 94% with an average of 96%.

B. Trip Blanks

The application trip blank was less than the LOQ of 0.090 ug/sample for EPTC. Six of the seven ambient trip blank results were less than the LOD of 0.060 ug/sample for EPTC and the remaining blank result was "detected".

C. Application Background Sample Results

All (four) of the application background sample results were below the LOQ for EPTC.

D. Colocated Sample Results

The results of application and ambient colocated samples are listed in Table 4 and Table 7 respectively. The relative difference (RD = difference/average x 100) is listed. There are no established acceptance criteria for colocated samples for this program. Generally though, relative difference results of up to 40% (i.e., the average ± 20%) are reasonable.

For the application study, six pairs of colocated samples were collected. All six pairs had a relative difference of less than 40%. For the ambient study, thirty-four pairs of colocated samples were collected. Sixteen of the pairs were below the LOD, eight of the pairs were "detected", three of the pairs had one value below the LOD and one value "detected", one pair had one value "detected" and one value above the LOQ, and the rest of the pairs had a relative difference of less than 40%.

E. Laboratory Spikes

Laboratory spikes are prepared at the same time and at the same level as the trip spike and field spike sets. The laboratory spikes are kept in a freezer until extraction and analysis. The extraction and analysis of laboratory, trip and field spikes normally occurs at the same time. Laboratory spikes for the ambient study were prepared by QMOSB staff. Laboratory spikes for the application study were prepared by Testing Section staff.

1) QMOSB Ambient Laboratory Spikes

The results of the eight QMOSB laboratory spikes, fortified with EPTC, are listed in Table 13. The average recovery of EPTC was 113%. A "head-to-head" analytical comparison of the standards used by the Testing Section and QMOSB showed that the QMOSB standard was 23.4% "high" relative to the Testing Section standard. The Testing Section's standard was prepared using a pure or "neat" solution whereas the QMOSB standard solution was purchased from AccuStandards Inc. After correction (Testing Section standard used as the reference standard) for the difference found between the EPTC standards used by the Testing Section and QMOSB, the average recovery was 86%.

2) Testing Section Application Laboratory Spikes

The results of the four laboratory spikes (spiked with 1.78 ug) are listed in Table 10. The average recovery of EPTC was 96%. These results indicate that the sample storage and analytical procedures used in this study produce acceptable results.

F. Trip Spikes

Trip spikes are prepared at the same time and at the same level as the laboratory spike and field spike sets. The trip spikes are kept in a freezer until transported to the field. The trip spike samples are kept on dry ice in an ice chest (the same one used for samples) during transport to and from the field and at all times while in the field except for trip spike sample log-in and labeling. Trip spikes for the ambient study were prepared by QMOSB staff and trip spikes for the application study were prepared by Testing Section staff.

1) QMOSB Ambient Trip Spikes

The results of the ten QMOSB trip spikes are listed in Table 14. The average recovery of EPTC was 119%. After correction for the difference found between the EPTC standards used by the Testing Section and QMOSB, the average recovery was 91%.

2) Testing Section Application Trip Spikes

The results of the four trip spikes (spiked with 1.78 ug of EPTC) are listed in Table 11. The average recovery of EPTC was 96%. These results are consistent with the QMOSB ambient trip spike results and indicate that the sample transport, storage and analytical procedures used in this study produce acceptable results for EPTC.

G. Field Spikes

Field spikes are prepared at the same time and at the same level as the laboratory spike and trip spike sets. The field spikes are kept in a freezer until transported to the field. The field spike samples are kept on dry ice in an ice chest (the same one used for samples) during transport to and from the field and at all times while in the field except for the sampling period. Field spikes were collected at the same environmental and experimental conditions as those occurring at the time of ambient sampling. The field spikes were obtained by sampling ambient air through a previously spiked cartridge. (i.e., colocated with an ambient or background sample). Field spike sets for the ambient study were prepared by QMOSB staff and field spikes for the application study were prepared by Testing Section staff.

1) QMOSB Ambient Field Spikes

The results of the four QMOSB field spikes are listed in Table 15. The field spikes were colocated with samples ARB19 and ARB20 which had results of <LOD for EPTC. The average recovery of EPTC was 110%. After correction for the difference found between the EPTC standards used by the Testing Section and QMOSB, the average recovery was 85%.

2) Testing Section Application Field Spikes

The results of the four field spikes (spiked with 1.78 ug of EPTC) are listed in Table 12. The field spikes were colocated with the four application background samples which all had results of <LOQ. The average recovery of EPTC was 88%. These results are consistent with the QMOSB ambient field spike results and indicate that the sampling, sample transport, storage and analytical procedures used in this study produce acceptable results for EPTC.

FIGURE 1. EPTC AMBIENT MONITORING AREA

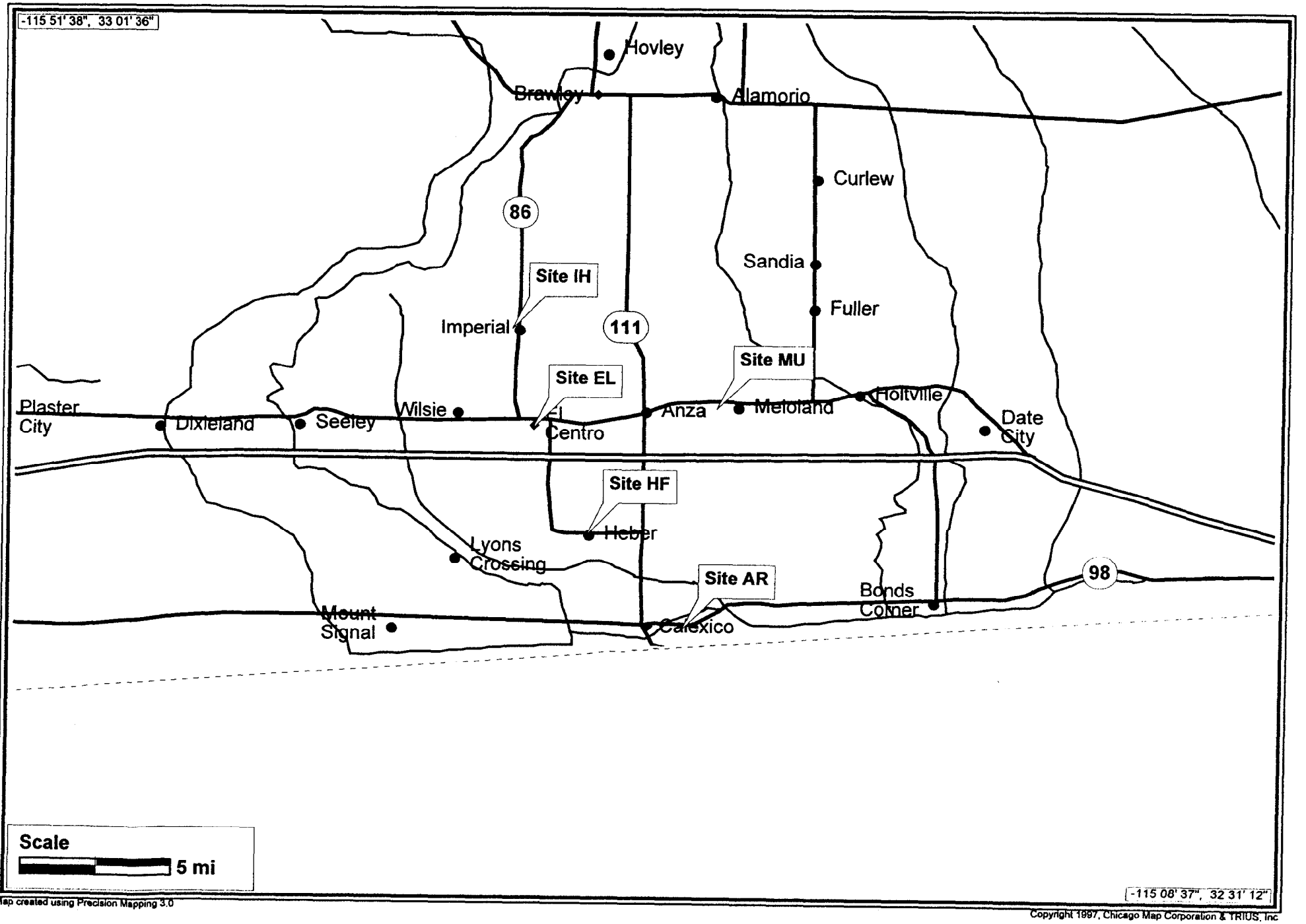
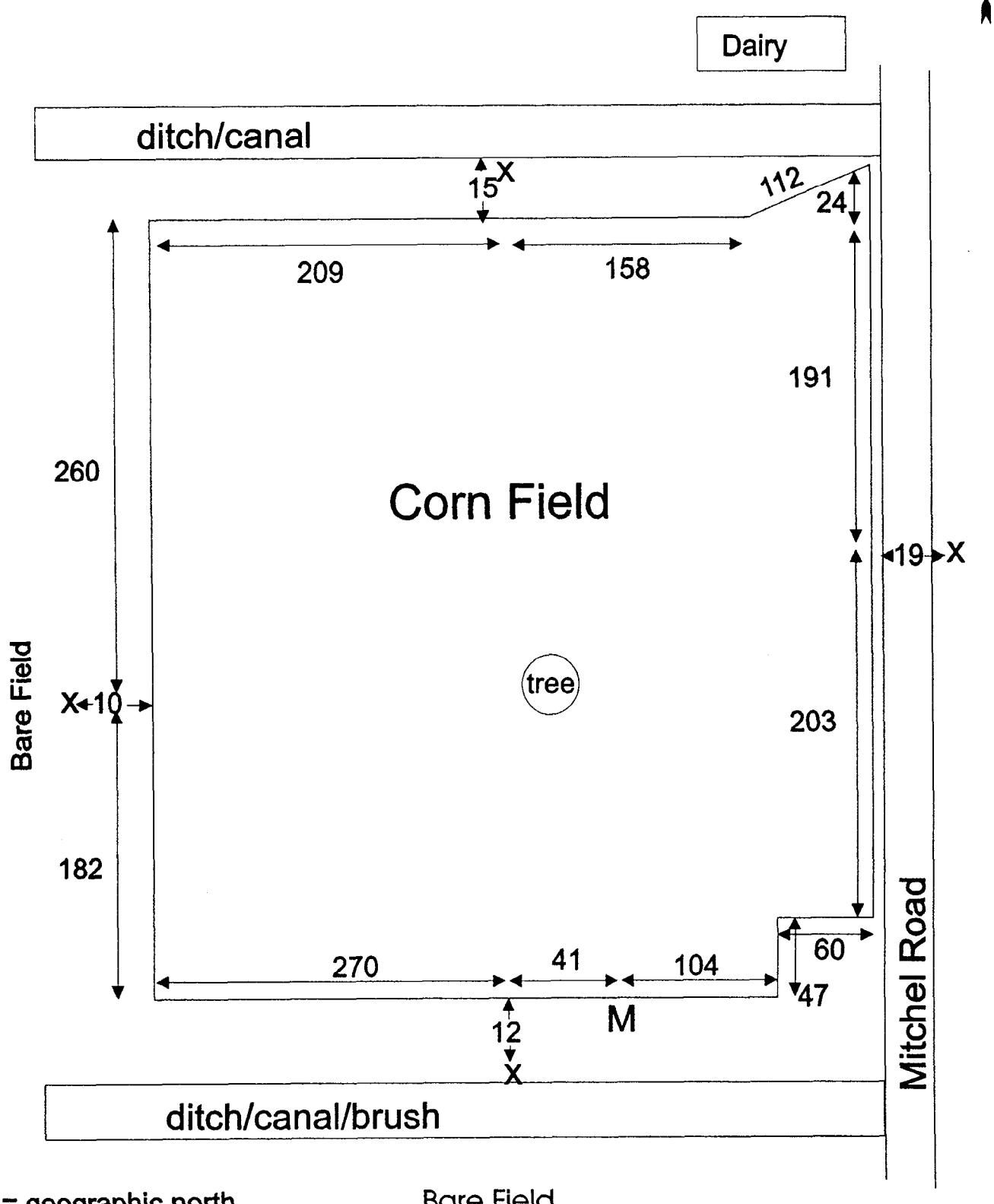
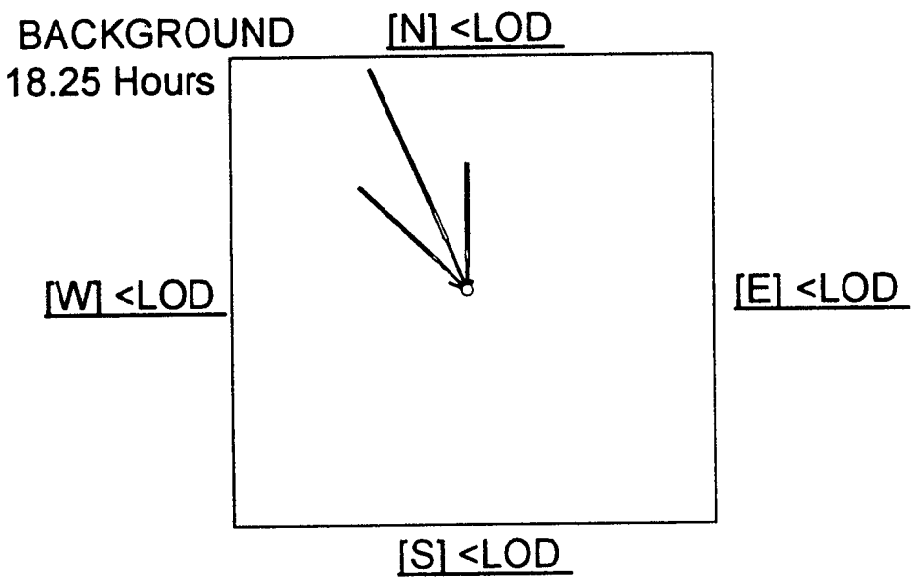


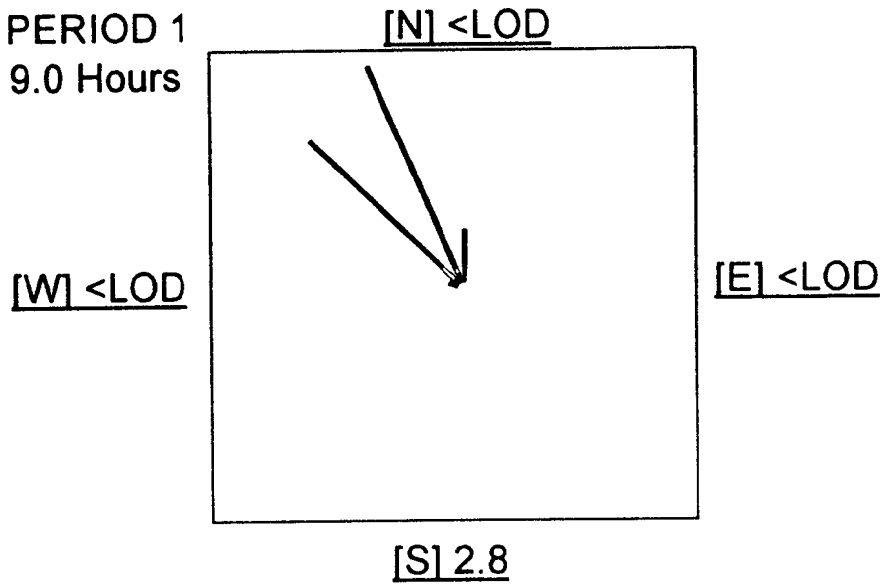
Figure 2
EPTC Application Site

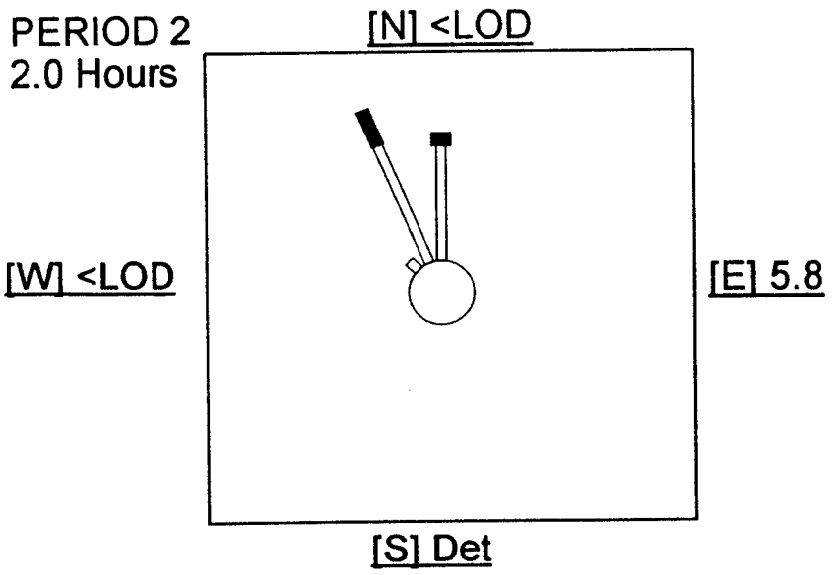


N = geographic north
M = meteorological station
x = air samplers
* distances in yards

FIGURE 3. EPTC APPLICATION DATA (ug/m3)







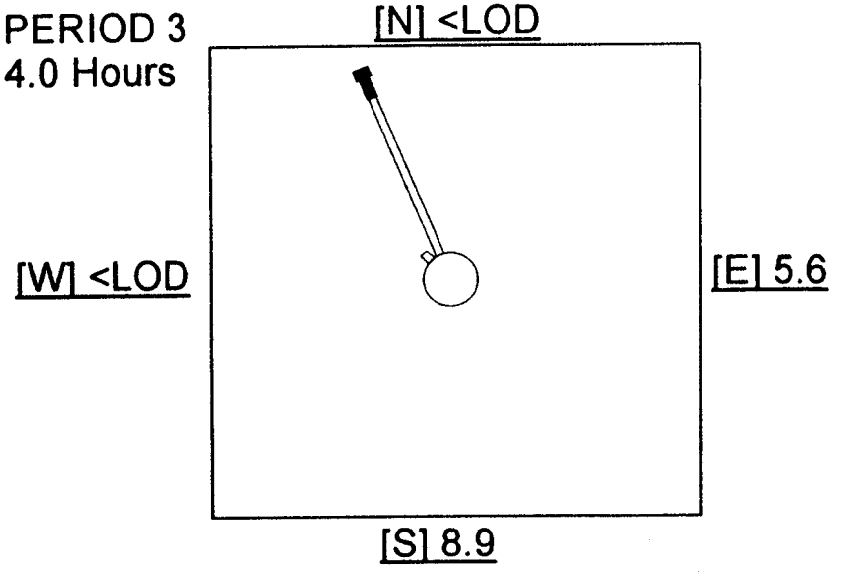
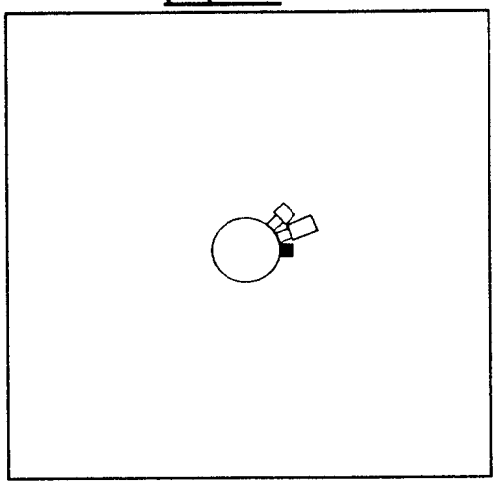


FIGURE 3. EPTC APPLICATION DATA (ug/m3)

PERIOD 4
9.0 Hours

[N] 2.5

[W] 8.4



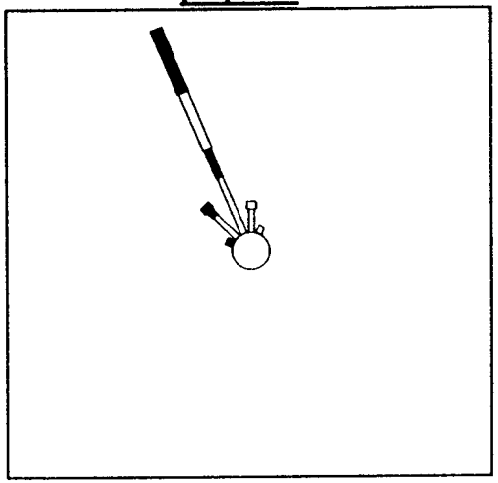
[E] 11

[S] 12

PERIOD 5
24.0 Hours

[N] .95

[W] .45



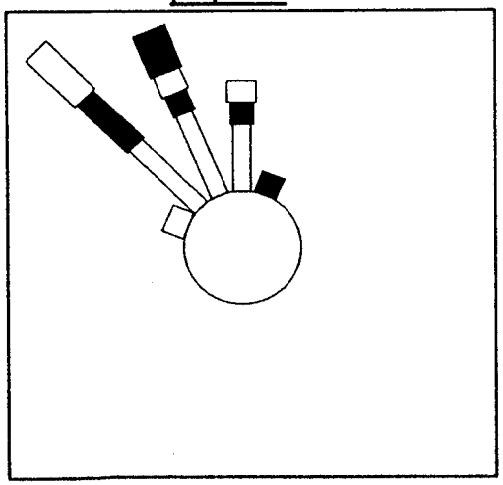
[E] 2.6

[S] .57

PERIOD 6
25.0 Hours

[N] .26

[W] .32



[E] .87

[S] .33

Table 4. EPTC Application Monitoring Results

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min)	Sample Volume (m3)	Date Analyzed	EPTC (ug)	(ug/m3)	*(pptv)
1	SB	5/26/97 12:40	5/27/97 06:50	1090	2.07	9/08/97	<LOQ	<LOQ	<LOQ
3	WB	5/26/97 12:40	5/27/97 07:00	1100	2.09	9/08/97	<LOQ	<LOQ	<LOQ
5	NB	5/26/97 12:40	5/27/97 07:00	1100	2.09	9/08/97	<LOQ	<LOQ	<LOQ
7	EB	5/26/97 12:40	5/27/97 07:05	1105	2.10	9/08/97	<LOQ	<LOQ	<LOQ
9	S1	5/27/97 06:50	5/27/97 15:55	545	1.04	9/08/97	2.92E+00	2.8E+00	3.6E+02
10	S1D	5/27/97 06:50	5/27/97 15:55	545	1.04	9/08/97	3.00E+00	2.9E+00	3.7E+02
11	W1	5/27/97 07:00	5/27/97 16:00	540	1.03	9/08/97	<LOQ	<LOQ	<LOQ
12	N1	5/27/97 07:00	5/27/97 16:05	545	1.04	9/08/97	<LOQ	<LOQ	<LOQ
13	E1	5/27/97 07:05	5/27/97 16:05	540	1.03	9/08/97	<LOQ	<LOQ	<LOQ
14	S2	5/27/97 15:55	5/27/97 17:55	120	0.23	9/08/97	1.20E-01	5.3E-01	6.8E+01
15	S2D	5/27/97 15:55	5/27/97 17:55	120	0.23	9/08/97	1.30E-01	5.7E-01	7.4E+01
16	W2	5/27/97 16:00	5/27/97 18:00	120	0.23	9/08/97	<LOQ	<LOQ	<LOQ
17	N2	5/27/97 16:05	5/27/97 18:00	115	0.22	9/08/97	<LOQ	<LOQ	<LOQ
18	E2	5/27/97 16:05	5/27/97 18:25	140	0.27	9/08/97	1.54E+00	5.8E+00	7.5E+02
19	S3	5/27/97 17:55	5/27/97 22:00	245	0.47	9/08/97	4.05E+00	8.7E+00	1.1E+03
20	S3D	5/27/97 17:55	5/27/97 22:00	245	0.47	9/08/97	4.25E+00	9.1E+00	1.2E+03
21	W3	5/27/97 18:00	5/27/97 22:00	240	0.46	9/08/97	<LOQ	<LOQ	<LOQ
22	N3	5/27/97 18:00	5/27/97 22:05	245	0.47	9/08/97	<LOQ	<LOQ	<LOQ
23	E3	5/27/97 18:25	5/27/97 22:05	220	0.42	9/09/97	2.35E+00	5.6E+00	7.3E+02
24	S4	5/27/97 22:00	5/28/97 07:00	540	1.03	9/09/97	1.20E+01	1.2E+01	1.5E+03
25	S4D	5/27/97 22:00	5/28/97 07:00	540	1.03	9/09/97	1.14E+01	1.1E+01	1.4E+03
26	W4	5/27/97 22:00	5/28/97 07:05	545	1.04	9/09/97	8.74E+00	8.4E+00	1.1E+03
27	N4	5/27/97 22:05	5/28/97 07:05	540	1.03	9/09/97	2.55E+00	2.5E+00	3.2E+02
28	E4	5/27/97 22:05	5/28/97 07:10	545	1.04	9/09/97	1.19E+01	1.1E+01	1.5E+03
29	S5	5/28/97 07:00	5/29/97 07:00	1440	2.74	9/09/97	1.71E+00	6.3E-01	8.1E+01
30	S5D	5/28/97 07:00	5/29/97 07:00	1440	2.74	9/09/97	1.42E+00	5.2E-01	6.7E+01

LOQ = 0.090 ug/sample

* pptv at 25 C and 1 atm

Table 4. EPTC Application Monitoring Results

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min)	Sample Volume (m3)	Date Analyzed	EPTC (ug)	(ug/m3)	*(pptv)
31	W5	5/28/97 07:05	5/29/97 07:10	1445	2.75	9/09/97	1.24E+00	4.5E-01	5.8E+01
32	N5	5/28/97 07:05	5/29/97 07:10	1445	2.75	9/09/97	2.61E+00	9.5E-01	1.2E+02
33	E5	5/28/97 07:10	5/29/97 07:15	1445	2.75	9/09/97	7.23E+00	2.6E+00	3.4E+02
34	S6	5/29/97 07:00	5/30/97 08:00	1500	2.85	9/09/97	1.05E+00	3.7E-01	4.8E+01
35	S6D	5/29/97 07:00	5/30/97 08:00	1500	2.85	9/09/97	8.10E-01	2.8E-01	3.7E+01
36	W6	5/29/97 07:10	5/30/97 08:10	1500	2.85	9/09/97	9.20E-01	3.2E-01	4.2E+01
37	N6	5/29/97 07:10	5/30/97 08:10	1500	2.85	9/09/97	7.30E-01	2.6E-01	3.3E+01
38	E6	5/29/97 07:15	5/30/97 08:15	1500	2.85	9/09/97	2.49E+00	8.7E-01	1.1E+02
39	BLANK	5/30/97 08:15	5/30/97 08:15	0	0.00	9/09/97	<LOQ	<LOQ	<LOQ

LOQ = 0.090 ug/sample
* pptv at 25 C and 1 atm

Table 5. Summary of EPTC Application Results (ug/m3)

Sampling Period	East	North	*South	West
Background	<LOQ	<LOQ	<LOQ	<LOQ
1	<LOQ	<LOQ	2.8	<LOQ
2	5.8	<LOQ	0.55	<LOQ
3	5.6	<LOQ	8.9	<LOQ
4	11	2.50	12	8.4
5	2.6	0.95	0.57	0.45
6	0.87	0.26	0.33	0.32

* Average of the collocated sample results
LOQ = 0.090 ug/sample

Table 6. EPTC Application Colocated Results

Log #	Sample ID	Start Date/Time	End Date/Time	EPTC (ug/m3)	Average	*RD
20	S1	5/27/97 06:50	5/27/97 15:55	2.8		
21	S1D	5/27/97 06:50	5/27/97 15:55	2.9	2.9	3.5%
22	S2	5/27/97 15:55	5/27/97 17:55	0.12		
23	S2D	5/27/97 15:55	5/27/97 17:55	0.13	0.13	8.0%
24	S3	5/27/97 17:55	5/27/97 22:00	8.7		
25	S3D	5/27/97 17:55	5/27/97 22:00	9.1	8.9	4.5%
26	S4	5/27/97 22:00	5/28/97 07:00	12		
27	S4D	5/27/97 22:00	5/28/97 07:00	11	12	8.7%
28	S5	5/28/97 07:00	5/29/97 07:00	0.63		
29	S5D	5/28/97 07:00	5/29/97 07:00	0.52	0.58	19%
30	S6	5/29/97 07:00	5/30/97 08:00	0.37		
31	S6D	5/29/97 07:00	5/30/97 08:00	0.28	0.33	28%

*RD = Relative Difference = (Difference/Average)100
LOQ = 0.90 ug per sample

Table 7. EPTC Ambient Monitoring Results

Log #	Sample ID	Start Date/Time	Finish Date/Time	Sample Time (min)	Sample Volume (m3)	Date Analyzed	EPTC (ug)	(ug/m3)	*(pptv)
1	AR01	10/09/96 08:35	10/10/96 10:00	1525	2.90	10/16/96	<LOD	<LOD	<LOD
2	AR01D	10/09/96 08:35	10/10/96 10:00	1525	2.90	10/16/96	<LOD	<LOD	<LOD
3	HF01	10/09/96 09:05	10/10/96 09:45	1480	2.81	10/16/96	<LOD	<LOD	<LOD
4	HF01D	10/09/96 09:05	10/10/96 09:45	1480	2.81	10/16/96	Det.	Det.	Det.
5	MU01	10/09/96 09:20	10/10/96 09:25	1445	2.75	10/16/96	5.40E-1	2.0E-1	2.5E+1
6	MU01D	10/09/96 09:20	10/10/96 09:25	1445	2.75	10/16/96	5.88E-1	2.1E-1	2.8E+1
7	EL01	10/09/96 09:55	10/10/96 09:10	1395	2.65	10/16/96	<LOD	<LOD	<LOD
8	EL01D	10/09/96 09:55	10/10/96 09:10	1395	2.65	10/16/96	<LOD	<LOD	<LOD
11	IH01	10/09/96 10:10	10/10/96 08:30	1340	2.55	10/16/96	Det.	Det.	Det.
12	IH01D	10/09/96 10:10	10/10/96 08:30	1340	2.55	10/16/96	<LOD	<LOD	<LOD
13	IH02	10/10/96 08:30	10/11/96 07:20	1370	2.60	10/16/96	<LOD	<LOD	<LOD
14	EL02	10/10/96 09:10	10/11/96 07:00	1310	2.49	10/16/96	<LOD	<LOD	<LOD
15	EL02D	10/10/96 09:10	10/11/96 07:00	1310	2.49	10/16/96	<LOD	<LOD	<LOD
16	MU02	10/10/96 09:25	10/11/96 07:40	1335	2.54	10/16/96	Det.	Det.	Det.
17	HF02	10/10/96 09:45	10/11/96 08:20	1355	2.57	10/16/96	Det.	Det.	Det.
18	AR02	10/10/96 10:00	10/11/96 08:00	1320	2.51	10/16/96	Det.	Det.	Det.
19	B2	10/11/96 08:20	10/11/96 08:20	0	0.00	10/16/96	<LOD	<LOD	<LOD
20	AR03	10/15/96 12:00	10/16/96 11:30	1410	2.68	10/22/96	<LOD	<LOD	<LOD
21	HF03	10/15/96 12:20	10/16/96 11:50	1410	2.68	10/22/96	<LOD	<LOD	<LOD
22	MU03	10/15/96 12:40	10/16/96 11:15	1355	2.57	10/22/96	2.47E-1	9.6E-2	1.2E+1
23	EL03	10/15/96 12:55	10/16/96 10:30	1295	2.46	10/22/96	<LOD	<LOD	<LOD
24	IH03	10/15/96 13:10	10/16/96 10:50	1300	2.47	10/22/96	Det.	Det.	Det.
25	EL04	10/16/96 10:30	10/17/96 10:00	1410	2.68	10/22/96	Det.	Det.	Det.
26	EL04D	10/16/96 10:30	10/17/96 10:00	1410	2.68	10/22/96	Det.	Det.	Det.
27	IH04	10/16/96 10:50	10/17/96 10:20	1410	2.68	10/22/96	2.94E-1	1.1E-1	1.4E+1
28	IH04D	10/16/96 10:50	10/17/96 10:20	1410	2.68	10/22/96	2.72E-1	1.0E-1	1.3E+1
29	MU04	10/16/96 11:15	10/17/96 10:45	1410	2.68	10/22/96	6.48E-1	2.4E-1	3.1E+1
31	AR04	10/16/96 11:30	10/17/96 11:00	1410	2.68	10/22/96	Det.	Det.	Det.
32	AR04D	10/16/96 11:30	10/17/96 11:00	1410	2.68	10/22/96	Det.	Det.	Det.
33	HF04	10/16/96 11:50	10/17/96 11:30	1420	2.70	10/22/96	Det.	Det.	Det.
34	HF04D	10/16/96 11:50	10/17/96 11:30	1420	2.70	10/22/96	<LOD	<LOD	<LOD
35	EL05	10/17/96 10:00	10/18/96 07:20	1280	2.43	10/22/96	<LOD	<LOD	<LOD

LOD = 0.0597 ug/sample

Det. = <0.197 ug/sample (LOQ) but >0.0597 ug/sample (LOD)

* pptv at 25 C and 1 atm

Table 7. EPTC Ambient Monitoring Results

Log #	Sample ID	Start Date/Time	Finish Date/Time	Sample Time (min)	Sample Volume (m3)	Date Analyzed	EPTC (ug)	(ug/m3)	*(pptv)
36	IH05	10/17/96 10:20	10/18/96 07:35	1275	2.42	10/22/96	<LOD	<LOD	<LOD
37	MU05	10/17/96 10:45	10/18/96 07:55	1270	2.41	10/22/96	4.84E-1	2.0E-1	2.6E+1
38	AR05	10/17/96 11:00	10/18/96 08:30	1290	2.45	10/22/96	Det.	Det.	Det.
39	HF05	10/17/96 11:30	10/18/96 08:10	1240	2.36	10/22/96	Det.	Det.	Det.
40	B5	10/18/96 08:10	10/18/96 08:10	0	0.00	10/22/96	Det.	Det.	Det.
41	IH06	10/21/96 11:18	10/22/96 10:42	1404	2.67	11/4/96	<LOD	<LOD	<LOD
42	MU06	10/21/96 11:49	10/22/96 11:06	1397	2.65	11/4/96	<LOD	<LOD	<LOD
43	AR06	10/21/96 12:21	10/22/96 11:28	1387	2.64	11/4/96	<LOD	<LOD	<LOD
44	HF06	10/21/96 12:39	10/22/96 11:49	1390	2.64	11/4/96	<LOD	<LOD	<LOD
45	EL06	10/21/96 13:13	10/22/96 10:17	1264	2.40	11/4/96	<LOD	<LOD	<LOD
46	EL07	10/22/96 10:17	10/23/96 09:27	1390	2.64	11/4/96	<LOD	<LOD	<LOD
47	IH07	10/22/96 10:42	10/23/96 09:44	1382	2.63	11/6/96	<LOD	<LOD	<LOD
48	MU07	10/22/96 11:06	10/23/96 10:09	1383	2.63	11/6/96	<LOD	<LOD	<LOD
49	AR07	10/22/96 11:28	10/23/96 10:40	1392	2.64	11/6/96	<LOD	<LOD	<LOD
50	HF07	10/22/96 11:49	10/23/96 11:08	1399	2.66	11/6/96	<LOD	<LOD	<LOD
51	EL08	10/23/96 09:27	10/24/96 09:30	1443	2.74	11/6/96	Det.	Det.	Det.
52	EL08D	10/23/96 09:27	10/24/96 09:30	1443	2.74	11/6/96	<LOD	<LOD	<LOD
53	IH08	10/23/96 09:44	10/24/96 09:55	1451	2.76	11/6/96	<LOD	<LOD	<LOD
54	IH08D	10/23/96 09:44	10/24/96 09:55	1451	2.76	11/6/96	<LOD	<LOD	<LOD
55	MU08	10/23/96 10:09	10/24/96 10:23	1454	2.76	11/6/96	2.78E-1	1.0E-1	1.3E+1
56	MU08D	10/23/96 10:09	10/24/96 10:23	1454	2.76	11/6/96	3.66E-1	1.3E-1	1.7E+1
57	AR08	10/23/96 10:40	10/24/96 10:44	1444	2.74	11/6/96	Det.	Det.	Det.
58	AR08D	10/23/96 10:40	10/24/96 10:44	1444	2.74	11/6/96	Det.	Det.	Det.
59	HF08	10/23/96 11:08	10/24/96 11:35	1467	2.79	11/6/96	Det.	Det.	Det.
60	HF08D	10/23/96 11:08	10/24/96 11:35	1467	2.79	11/6/96	Det.	Det.	Det.
61	EL09	10/24/96 09:30	10/25/96 09:00	1410	2.68	11/6/96	<LOD	<LOD	<LOD
62	IH09	10/24/96 09:55	10/25/96 09:30	1415	2.69	11/6/96	<LOD	<LOD	<LOD
63	MU09	10/24/96 10:23	10/25/96 10:35	1452	2.76	11/6/96	3.45E-1	1.3E-1	1.6E+1
64	AR09	10/24/96 10:44	10/25/96 11:09	1465	2.78	11/6/96	<LOD	<LOD	<LOD
65	HF09	10/24/96 11:35	10/25/96 11:40	1445	2.75	11/6/96	<LOD	<LOD	<LOD
66	B9	10/25/96 11:40	10/25/96 11:40	0	0.00	11/6/96	<LOD	<LOD	<LOD
67	EL10	10/25/96 09:00	10/26/96 08:30	1410	2.68	11/5/96	<LOD	<LOD	<LOD

LOD = 0.0597 ug/sample

Det. = <0.197 ug/sample (LOQ) but >0.0597 ug/sample (LOD)

* pptv at 25 C and 1 atm

Table 7. EPTC Ambient Monitoring Results

Log #	Sample ID	Start Date/Time	Finish Date/Time	Sample Time (min)	Sample Volume (m3)	Date Analyzed	EPTC (ug)	(ug/m3)	*(pptv)
68	IH10	10/25/96 09:30	10/26/96 08:51	1401	2.66	11/5/96	<LOD	<LOD	<LOD
69	MU10	10/25/96 10:35	10/26/96 09:15	1360	2.58	11/5/96	<LOD	<LOD	<LOD
70	AR10	10/25/96 11:09	10/26/96 09:33	1344	2.55	11/5/96	<LOD	<LOD	<LOD
71	HF10	10/25/96 11:40	10/26/96 10:08	1348	2.56	11/5/96	<LOD	<LOD	<LOD
72	EL11	10/26/96 08:30	10/27/96 08:13	1423	2.70	11/5/96	<LOD	<LOD	<LOD
73	IH11	10/26/96 08:51	10/27/96 08:31	1420	2.70	11/5/96	<LOD	<LOD	<LOD
74	MU11	10/26/96 09:15	10/27/96 08:55	1420	2.70	11/5/96	Det.	Det.	Det.
75	AR11	10/26/96 09:33	10/27/96 09:14	1421	2.70	11/5/96	<LOD	<LOD	<LOD
76	HF11	10/26/96 10:08	10/27/96 09:38	1410	2.68	11/5/96	3.13E-1	1.2E-1	1.5E+1
77	EL12	10/27/96 08:13	10/28/96 06:48	1355	2.57	11/7/96	<LOD	<LOD	<LOD
78	EL12D	10/27/96 08:13	10/28/96 06:48	1355	2.57	11/7/96	<LOD	<LOD	<LOD
79	IH12	10/27/96 08:31	10/28/96 07:11	1360	2.58	11/7/96	<LOD	<LOD	<LOD
80	IH12D	10/27/96 08:31	10/28/96 07:11	1360	2.58	11/7/96	<LOD	<LOD	<LOD
81	MU12	10/27/96 08:55	10/28/96 07:31	1356	2.58	11/7/96	Det.	Det.	Det.
82	MU12D	10/27/96 08:55	10/28/96 07:31	1356	2.58	11/7/96	Det.	Det.	Det.
83	AR12	10/27/96 09:14	10/28/96 08:08	1374	2.61	11/7/96	<LOD	<LOD	<LOD
84	AR12D	10/27/96 09:14	10/28/96 08:08	1374	2.61	11/7/96	<LOD	<LOD	<LOD
85	HF12	10/27/96 09:38	10/28/96 07:50	1332	2.53	11/7/96	5.16E-1	2.0E-1	2.6E+1
86	HF12D	10/27/96 09:38	10/28/96 07:50	1332	2.53	11/7/96	4.79E-1	1.9E-1	2.4E+1
87	EL13	10/28/96 06:48	10/29/96 07:41	1493	2.84	11/7/96	<LOD	<LOD	<LOD
88	IH13	10/28/96 07:11	10/29/96 08:06	1495	2.84	11/7/96	<LOD	<LOD	<LOD
89	MU13	10/28/96 07:31	10/29/96 08:31	1500	2.85	11/7/96	<LOD	<LOD	<LOD
90	AR13	10/28/96 08:08	10/29/96 09:52	1544	2.93	11/7/96	<LOD	<LOD	<LOD
91	HF13	10/28/96 07:50	10/29/96 09:33	1543	2.93	11/7/96	Det.	Det.	Det.
92	EL14	10/29/96 07:41	10/30/96 06:55	1394	2.65	11/7/96	<LOD	<LOD	<LOD
93	IH14	10/29/96 08:06	10/30/96 07:12	1386	2.63	11/7/96	<LOD	<LOD	<LOD
94	MU14	10/29/96 08:31	10/30/96 07:31	1380	2.62	11/7/96	5.69E-1	2.2E-1	2.8E+1
95	AR14	10/29/96 09:50	10/30/96 08:15	1345	2.56	11/7/96	<LOD	<LOD	<LOD
96	B14	10/30/96 08:15	10/30/96 08:15	0	0.00	11/7/96	<LOD	<LOD	<LOD
96	HF14	10/29/96 09:33	10/30/96 07:40	1327	2.52	11/7/96	Det.	Det.	Det.
98	EL15	11/04/96 13:40	11/05/96 11:30	1310	2.49	11/21/96	2.00E-1	8.0E-2	1.0E+1
99	HF15	11/04/96 14:15	11/05/96 12:00	1305	2.48	11/21/96	Det.	Det.	Det.

LOD = 0.0597 ug/sample

Det. = <0.197 ug/sample (LOQ) but >0.0597 ug/sample (LOD)

* pptv at 25 C and 1 atm

Table 7. EPTC Ambient Monitoring Results

Log #	Sample ID	Start Date/Time	Finish Date/Time	Sample Time (min)	Sample Volume (m3)	Date Analyzed	EPTC (ug)	(ug/m3)	*(pptv)
100	AR15	11/04/96 14:35	11/05/96 12:25	1310	2.49	11/21/96	Det.	Det.	Det.
101	MU15	11/04/96 15:05	11/05/96 13:00	1315	2.50	11/21/96	2.19E-1	8.8E-2	1.1E+1
102	IH15	11/04/96 15:25	11/05/96 13:30	1325	2.52	11/21/96	2.42E-1	9.6E-2	1.2E+1
103	EL16	11/05/96 11:30	11/06/96 11:00	1410	2.68	11/21/96	<LOD	<LOD	<LOD
105	HF16	11/05/96 12:00	11/06/96 11:30	1410	2.68	11/21/96	<LOD	<LOD	<LOD
107	AR16	11/05/96 12:25	11/06/96 11:50	1405	2.67	11/21/96	<LOD	<LOD	<LOD
109	MU16	11/05/96 13:00	11/06/96 12:15	1395	2.65	11/21/96	<LOD	<LOD	<LOD
111	IH16	11/05/96 13:30	11/06/96 13:00	1410	2.68	11/21/96	<LOD	<LOD	<LOD
113	EL17	11/06/96 11:00	11/07/96 09:30	1350	2.57	11/21/96	<LOD	<LOD	<LOD
114	EL17D	11/06/96 11:00	11/07/96 09:30	1350	2.57	11/21/96	<LOD	<LOD	<LOD
115	HF17	11/06/96 11:30	11/07/96 10:00	1350	2.57	11/21/96	<LOD	<LOD	<LOD
116	HF17D	11/06/96 11:30	11/07/96 10:00	1350	2.57	11/21/96	<LOD	<LOD	<LOD
117	AR17	11/06/96 11:50	11/07/96 10:20	1350	2.57	11/21/96	<LOD	<LOD	<LOD
118	AR17D	11/06/96 11:50	11/07/96 10:20	1350	2.57	11/21/96	<LOD	<LOD	<LOD
119	MU17	11/06/96 12:15	11/07/96 10:50	1355	2.57	11/21/96	<LOD	<LOD	<LOD
120	MU17D	11/06/96 12:15	11/07/96 10:50	1355	2.57	11/21/96	<LOD	<LOD	<LOD
121	IH17	11/06/96 13:00	11/07/96 11:20	1340	2.55	11/21/96	<LOD	<LOD	<LOD
122	IH17D	11/06/96 13:00	11/07/96 11:20	1340	2.55	11/21/96	<LOD	<LOD	<LOD
123	EL18	11/07/96 09:30	11/08/96 08:30	1380	2.62	11/21/96	Det.	Det.	Det.
124	HF18	11/07/96 10:00	11/08/96 09:00	1380	2.62	11/21/96	Det.	Det.	Det.
125	AR18	11/07/96 10:20	11/08/96 09:25	1385	2.63	11/21/96	<LOD	<LOD	<LOD
126	MU18	11/07/96 10:50	11/08/96 10:00	1390	2.64	11/21/96	Det.	Det.	Det.
127	IH18	11/07/96 12:00	11/08/96 11:30	1410	2.68	11/21/96	2.44E-1	9.1E-2	1.2E+1
128	B18	11/08/96 11:30	11/08/96 11:30	0	0.00	11/21/96	<LOD	<LOD	<LOD
129	HF19	11/12/96 14:25	11/13/96 14:30	1445	2.75	11/22/96	2.78E-1	1.0E-1	1.3E+1
130	AR19	11/12/96 15:00	11/13/96 14:00	1380	2.62	11/22/96	<LOD	<LOD	<LOD
131	MU19	11/12/96 14:00	11/13/96 13:40	1420	2.70	11/22/96	<LOD	<LOD	<LOD
132	IH19	11/12/96 13:40	11/13/96 12:40	1380	2.62	11/22/96	Det.	Det.	Det.
133	EL19	11/12/96 13:20	11/13/96 13:00	1420	2.70	11/22/96	<LOD	<LOD	<LOD
137	EL20	11/13/96 13:00	11/14/96 11:30	1350	2.57	11/22/96	<LOD	<LOD	<LOD
138	EL20D	11/13/96 13:00	11/14/96 11:30	1350	2.57	11/22/96	<LOD	<LOD	<LOD
139	IH20	11/13/96 13:20	11/14/96 12:00	1360	2.58	11/22/96	<LOD	<LOD	<LOD

LOD = 0.0597 ug/sample

Det. = <0.197 ug/sample (LOQ) but >0.0597 ug/sample (LOD)

* pptv at 25 C and 1 atm

Table 7. EPTC Ambient Monitoring Results

Log #	Sample ID	Start Date/Time	Finish Date/Time	Sample Time (min)	Sample Volume (m3)	Date Analyzed	EPTC (ug)	(ug/m3)	*(pptv)
140	IH20D	11/13/96 13:20	11/14/96 12:00	1360	2.58	11/22/96	<LOD	<LOD	<LOD
141	MU20	11/13/96 13:40	11/14/96 12:30	1370	2.60	11/22/96	<LOD	<LOD	<LOD
142	MU20D	11/13/96 13:40	11/14/96 12:30	1370	2.60	11/22/96	<LOD	<LOD	<LOD
143	AR20	11/13/96 14:00	11/14/96 13:15	1395	2.65	11/22/96	<LOD	<LOD	<LOD
144	AR20D	11/13/96 14:00	11/14/96 13:15	1395	2.65	11/22/96	<LOD	<LOD	<LOD
145	HF20	11/13/96 14:30	11/14/96 12:45	1335	2.54	11/22/96	<LOD	<LOD	<LOD
146	HF20D	11/13/96 14:30	11/14/96 12:45	1335	2.54	11/22/96	<LOD	<LOD	<LOD
147	EL21	11/14/96 11:30	11/15/96 09:00	1290	2.45	11/22/96	<LOD	<LOD	<LOD
150	IH21	11/14/96 12:00	11/15/96 09:30	1290	2.45	11/22/96	<LOD	<LOD	<LOD
151	MU21	11/14/96 12:03	11/15/96 09:15	1272	2.42	11/22/96	<LOD	<LOD	<LOD
152	HF21	11/14/96 12:45	11/15/96 10:15	1290	2.45	11/22/96	<LOD	<LOD	<LOD
153	AR21	11/14/96 13:15	11/15/96 10:00	1245	2.37	11/22/96	<LOD	<LOD	<LOD
154	EL22	11/18/96 10:52	11/19/96 10:38	1426	2.71	11/26/96	<LOD	<LOD	<LOD
158	IH22	11/18/96 11:28	11/19/96 11:03	1415	2.69	11/26/96	Det.	Det.	Det.
159	MU22	11/18/96 11:47	11/19/96 11:15	1408	2.68	11/26/96	Det.	Det.	Det.
160	AR22	11/18/96 12:11	11/19/96 12:05	1434	2.72	11/26/96	Det.	Det.	Det.
161	HF22	11/18/96 12:38	11/19/96 11:34	1376	2.61	11/26/96	2.25E-1	8.6E-2	1.1E+1
162	EL23	11/19/96 10:38	11/20/96 07:49	1271	2.41	11/27/96	<LOD	<LOD	<LOD
166	IH23	11/19/96 11:03	11/20/96 08:39	1296	2.46	11/26/96	Det.	Det.	Det.
167	MU23	11/19/96 11:25	11/20/96 09:01	1296	2.46	11/26/96	3.18E-1	1.3E-1	1.7E+1
168	HF23	11/19/96 11:44	11/20/96 09:45	1321	2.51	11/26/96	4.24E-1	1.7E-1	2.2E+1
169	AR23	11/19/96 12:05	11/20/96 09:20	1275	2.42	11/26/96	Det.	Det.	Det.
170	EL24	11/20/96 07:49	11/21/96 06:40	1371	2.60	11/26/96	3.11E-1	1.2E-1	1.5E+1
171	EL24D	11/20/96 07:49	11/21/96 06:40	1371	2.60	11/26/96	3.19E-1	1.2E-1	1.6E+1
172	IH24	11/20/96 08:39	11/21/96 06:57	1338	2.54	11/26/96	Det.	Det.	Det.
173	IH24D	11/20/96 08:39	11/21/96 06:57	1338	2.54	11/26/96	Det.	Det.	Det.
174	MU24	11/20/96 09:01	11/21/96 07:16	1335	2.54	11/26/96	Det.	Det.	Det.
175	MU24D	11/20/96 09:01	11/21/96 07:16	1335	2.54	11/26/96	2.28E-1	9.0E-2	1.2E+1
176	AR24	11/20/96 09:20	11/21/96 07:35	1335	2.54	11/26/96	Det.	Det.	Det.
177	AR24D	11/20/96 09:20	11/21/96 07:35	1335	2.54	11/26/96	Det.	Det.	Det.
178	HF24	11/20/96 09:45	11/21/96 08:16	1351	2.57	11/26/96	2.41E-1	9.4E-2	1.2E+1
179	HF24D	11/20/96 09:45	11/21/96 08:16	1351	2.57	11/27/96	2.37E-1	9.2E-2	1.2E+1

LOD = 0.0597 ug/sample

Det. = <0.197 ug/sample (LOQ) but >0.0597 ug/sample (LOD)

* pptv at 25 C and 1 atm

Table 7. EPTC Ambient Monitoring Results

Log #	Sample ID	Start Date/Time	Finish Date/Time	Sample Time (min)	Sample Volume (m3)	Date Analyzed	EPTC (ug)	(ug/m3)	*(pptv)
180	B24	11/21/96 08:16	11/21/96 08:16	0	0.00	11/27/96	<LOD	<LOD	<LOD
153B	B21	11/15/96 10:00	11/15/96 10:00	0	0.00	11/22/96	<LOD	<LOD	<LOD

LOD = 0.0597 ug/sample
Det. = <0.197 ug/sample (LOQ) but >0.0597 ug/sample (LOD)
* pptv at 25 C and 1 atm

Table 8. Summary of EPTC Ambient Monitoring Results (ug/m3)

Start Date	ARB	EL	HF	IH	MU
10/9/96	<LOD	<LOD	<LOD	Det.	0.20
10/9/96	<LOD	<LOD	Det.	<LOD	0.21
10/10/96	Det.	<LOD	Det.	<LOD	Det.
10/15/96	<LOD	<LOD	<LOD	Det.	0.096
10/16/96	Det.	Det.	Det.	0.11	0.24
10/16/96	Det.	Det.	<LOD	0.10	NR
10/17/96	Det.	<LOD	Det.	<LOD	0.20
10/21/96	<LOD	<LOD	<LOD	<LOD	<LOD
10/22/96	<LOD	<LOD	<LOD	<LOD	<LOD
10/23/96	Det.	Det.	Det.	<LOD	0.10
10/23/96	Det.	<LOD	Det.	<LOD	0.13
10/24/96	<LOD	<LOD	<LOD	<LOD	0.13
10/25/96	<LOD	<LOD	<LOD	<LOD	<LOD
10/26/96	<LOD	<LOD	0.12	<LOD	Det.
10/27/96	<LOD	<LOD	0.20	<LOD	Det.
10/27/96	<LOD	<LOD	0.19	<LOD	Det.
10/28/96	<LOD	<LOD	Det.	<LOD	<LOD
10/29/96	<LOD	<LOD	Det.	<LOD	0.22
11/4/96	Det.	0.080	Det.	0.096	0.088
11/5/96	<LOD	<LOD	<LOD	<LOD	<LOD
11/6/96	<LOD	<LOD	<LOD	<LOD	<LOD
11/6/96	<LOD	<LOD	<LOD	<LOD	<LOD
11/7/96	<LOD	Det.	Det.	0.091	Det.
11/12/96	<LOD	<LOD	0.10	<LOD	<LOD
11/13/96	<LOD	<LOD	<LOD	<LOD	<LOD
11/13/96	<LOD	<LOD	<LOD	<LOD	<LOD
11/14/96	<LOD	<LOD	<LOD	<LOD	<LOD
11/18/96	Det.	<LOD	0.09	Det.	Det.
11/19/96	Det.	<LOD	0.17	Det.	0.13
11/20/96	Det.	0.12	0.094	Det.	Det.
11/20/96	Det.	0.12	0.092	Det.	0.090

Maximum	Det.	0.12	0.20	0.11	0.24
Mean	Det.	0.068	0.082	0.067	0.12
# Samples	24	24	24	24	24
# > LOQ	0	2	6	3	10
# > LOD	8	5	14	8	15

Only the higher value of each collocated pair was used for the above statistics.
Det. values (<LOQ but >LOD) were factored as (LOD+LOQ)/2; assume 2.74 m3 volume.
Values <LOD were not used to calculate the mean.

NR - Not Reported due to sample loss
LOD = 0.0597 ug/sample
Det. = <0.197 ug/sample (LOQ) but >0.0597 ug/sample (LOD)

Table 9. EPTC Ambient Colocated Results

Sample Name	Start Date/Time	Finish Date/Time	EPTC Air Conc. (ug/m3)	Average	Relative Difference
AR01	10/09/96 08:35	10/10/96 10:00	<LOD		
AR01D	10/09/96 08:35	10/10/96 10:00	<LOD	<LOD	<LOD
AR04	10/16/96 11:30	10/17/96 11:00	Det.		
AR04D	10/16/96 11:30	10/17/96 11:00	Det.	Det.	Det.
AR08	10/23/96 10:40	10/24/96 10:44	Det.		
AR08D	10/23/96 10:40	10/24/96 10:44	Det.	Det.	Det.
AR12	10/27/96 09:14	10/28/96 08:08	<LOD		
AR12D	10/27/96 09:14	10/28/96 08:08	<LOD	<LOD	<LOD
AR17	11/06/96 11:50	11/07/96 10:20	<LOD		
AR17D	11/06/96 11:50	11/07/96 10:20	<LOD	<LOD	<LOD
AR20	11/13/96 14:00	11/14/96 13:15	<LOD		
AR20D	11/13/96 14:00	11/14/96 13:15	<LOD	<LOD	<LOD
AR24	11/20/96 09:20	11/21/96 07:35	Det.		
AR24D	11/20/96 09:20	11/21/96 07:35	Det.	Det.	Det.
EL01	10/09/96 09:55	10/10/96 09:10	<LOD		
EL01D	10/09/96 09:55	10/10/96 09:10	<LOD	<LOD	<LOD
EL04	10/16/96 10:30	10/17/96 10:00	Det.		
EL04D	10/16/96 10:30	10/17/96 10:00	Det.	Det.	Det.
EL08	10/23/96 09:27	10/24/96 09:30	Det.		
EL08D	10/23/96 09:27	10/24/96 09:30	Det.	Det.	Det.

LOD = 0.0597 ug/sample
Det. = <0.197 ug/sample (LOQ) but >0.0597 ug/sample (LOD)

Table 9. EPTC Ambient Colocated Results

Sample Name	Start Date/Time	Finish Date/Time	EPTC Air Conc. (ug/m3)	Average	Relative Difference
EL12	10/27/96 08:13	10/28/96 06:48	<LOD		
EL12D	10/27/96 08:13	10/28/96 06:48	<LOD	<LOD	<LOD
EL17	11/06/96 11:00	11/07/96 09:30	<LOD		
EL17D	11/06/96 11:00	11/07/96 09:30	<LOD	<LOD	<LOD
EL20	11/13/96 13:00	11/14/96 11:30	<LOD		
EL20D	11/13/96 13:00	11/14/96 11:30	<LOD	<LOD	<LOD
EL24	11/20/96 07:49	11/21/96 06:40	1.2E-1		
EL24D	11/20/96 07:49	11/21/96 06:40	1.2E-1	1.2E-1	2.4%
HF01	10/09/96 09:05	10/10/96 09:45	<LOD		
HF01D	10/09/96 09:05	10/10/96 09:45	Det.	<LOD	<LOD
HF04	10/16/96 11:50	10/17/96 11:30	Det.		
HF04D	10/16/96 11:50	10/17/96 11:30	<LOD	<LOD	<LOD
HF08	10/23/96 11:08	10/24/96 11:35	Det.		
HF08D	10/23/96 11:08	10/24/96 11:35	Det.	Det.	Det.
HF12	10/27/96 09:38	10/28/96 07:50	2.0E-1		
HF12D	10/27/96 09:38	10/28/96 07:50	1.9E-1	2.0E-1	7.6%
HF17	11/06/96 11:30	11/07/96 10:00	<LOD		
HF17D	11/06/96 11:30	11/07/96 10:00	<LOD	<LOD	<LOD
HF20	11/13/96 14:30	11/14/96 12:45	<LOD		
HF20D	11/13/96 14:30	11/14/96 12:45	<LOD	<LOD	<LOD

LOD = 0.0597 ug/sample
Det. = <0.197 ug/sample (LOQ) but >0.0597 ug/sample (LOD)

Table 9. EPTC Ambient Colocated Results

Sample Name	Start Date/Time	Finish Date/Time	EPTC Air Conc. (ug/m3)	Average	Relative Difference
HF24	11/20/96 09:45	11/21/96 08:16	9.4E-2		
HF24D	11/20/96 09:45	11/21/96 08:16	9.2E-2	9.3E-2	**1.4%**
IH01	10/09/96 10:10	10/10/96 08:30	Det.		
IH01D	10/09/96 10:10	10/10/96 08:30	<LOD	<LOD	**<LOD**
IH04	10/16/96 10:50	10/17/96 10:20	1.1E-1		
IH04D	10/16/96 10:50	10/17/96 10:20	1.0E-1	1.1E-1	**7.9%**
IH08	10/23/96 09:44	10/24/96 09:55	<LOD		
IH08D	10/23/96 09:44	10/24/96 09:55	<LOD	<LOD	**<LOD**
IH12	10/27/96 08:31	10/28/96 07:11	<LOD		
IH12D	10/27/96 08:31	10/28/96 07:11	<LOD	<LOD	**<LOD**
IH17	11/06/96 13:00	11/07/96 11:20	<LOD		
IH17D	11/06/96 13:00	11/07/96 11:20	<LOD	<LOD	**<LOD**
IH20	11/13/96 13:20	11/14/96 12:00	<LOD		
IH20D	11/13/96 13:20	11/14/96 12:00	<LOD	<LOD	**<LOD**
IH24	11/20/96 08:39	11/21/96 06:57	Det.		
IH24D	11/20/96 08:39	11/21/96 06:57	Det.	Det.	**Det.**
MU01	10/09/96 09:20	10/10/96 09:25	2.0E-1		
MU01D	10/09/96 09:20	10/10/96 09:25	2.1E-1	2.1E-1	**8.4%**
MU08	10/23/96 10:09	10/24/96 10:23	1.0E-1		
MU08D	10/23/96 10:09	10/24/96 10:23	1.3E-1	1.2E-1	**27.0%**

LOD = 0.0597 ug/sample
Det. = <0.197 ug/sample (LOQ) but >0.0597 ug/sample (LOD)

Table 9. EPTC Ambient Colocated Results

Sample Name	Start Date/Time	Finish Date/Time	EPTC Air Conc. (ug/m3)	Average	Relative Difference
MU12	10/27/96 08:55	10/28/96 07:31	Det.		
MU12D	10/27/96 08:55	10/28/96 07:31	Det.	Det.	Det.
MU17	11/06/96 12:15	11/07/96 10:50	<LOD		
MU17D	11/06/96 12:15	11/07/96 10:50	<LOD	<LOD	<LOD
MU20	11/13/96 13:40	11/14/96 12:30	<LOD		
MU20D	11/13/96 13:40	11/14/96 12:30	<LOD	<LOD	<LOD
MU24	11/20/96 09:01	11/21/96 07:16	Det.		
MU24D	11/20/96 09:01	11/21/96 07:16	9.0E-2	Det.	Det.

LOD = 0.0597 ug/sample
Det. = <0.197 ug/sample (LOQ) but >0.0597 ug/sample (LOD)

Table 10. EPTC *Application Laboratory* Spike Results

Sample ID	Date Analyzed	EPTC Mass (ug)	Expected Mass (ug)	Percent Recovery
CDFA-F1	9/22/97	1.67	1.78	94%
CDFA-F2	9/22/97	1.70	1.78	96%
CDFA-F3	9/22/97	1.77	1.78	99%
CDFA-F4	9/22/97	1.68	1.78	94%

*Prepared by Testing Section staff.

Table 11. EPTC *Application Trip* Spike Results

Sample ID	Date Analyzed	EPTC Mass (ug)	Expected Mass (ug)	Percent Recovery
TS1	9/22/97	1.73	1.78	97%
TS2	9/22/97	1.68	1.78	94%
TS3	9/22/97	1.72	1.78	97%
TS4	9/22/97	1.74	1.78	98%

*Prepared by Testing Section staff.

Table 12. EPTC *Application Field* Spike Results

Sample ID	Date Analyzed	EPTC Mass (ug)	Expected Mass (ug)	Percent Recovery
SFS1	9/22/97	1.58	1.78	89%
WFS2	9/22/97	1.60	1.78	90%
NFS3	9/22/97	1.55	1.78	87%
EFS4	9/22/97	1.52	1.78	85%

*Prepared by Testing Section staff.

Table 13. EPTC *Ambient Laboratory* Spike Results

Sample ID	Date Analyzed	EPTC Mass (ug)	Expected Mass (ug)	Percent Recovery	Corrected Percent Recovery*
QA-EPTC-L2A	11/20/96	0.230	0.191	120%	92%
QA-EPTC-L3A	11/20/96	0.236	0.191	124%	95%
QA-EPTC-L4A	11/20/96	0.761	0.688	111%	85%
QA-EPTC-L5A	11/20/96	0.726	0.688	106%	81%
QA-EPTC-L7A	11/20/96	1.27	1.15	110%	85%
QA-EPTC-L8A	11/20/96	1.25	1.15	109%	83%
QA-EPTC-L9A	11/20/96	0.430	0.382	113%	86%
QA-EPTC-L10A	11/20/96	0.420	0.382	110%	84%

*Prepared by QMOSB staff.

Table 14. EPTC *Ambient Trip* Spike Results

Sample ID	Date Analyzed	EPTC Mass (ug)	Expected Mass (ug)	Percent Recovery	Corrected Percent Recovery*
QA-EPTC-T1A	11/22/96	1.37	1.15	119%	91%
QA-EPTC-T2A	11/22/96	1.35	1.15	117%	90%
QA-EPTC-T3A	11/22/96	0.818	0.688	119%	91%
QA-EPTC-T4A	11/22/96	0.830	0.688	121%	92%

*Prepared by QMOSB staff.

Table 15. EPTC *Ambient Field* Spike Results

Sample ID	Date Analyzed	EPTC Mass (ug)	Expected Mass (ug)	Percent Recovery	Corrected Percent Recovery*
QA-EPTC-F2A	11/22/96	0.744	0.688	108%	83%
QA-EPTC-F3A	11/22/96	0.779	0.688	113%	87%
QA-EPTC-F4A	11/22/96	1.1	0.994	111%	85%
QA-EPTC-F5A	11/22/96	1.09	0.994	110%	84%

*Prepared by QMOSB staff.

*Recoveries corrected for the difference between the QMOSB and Testing Section standards.